

CLAIMS

We claim:

1. A system configured for minimizing electromagnetic radiation in an optical transceiver comprising:

an optical subassembly;

a transceiver substrate; and

a coupling member that communicatively couples the optical subassembly to the transceiver substrate, wherein the coupling member comprises:

a signal trace layer that provides one or more signal pathways between the optical subassembly and the transceiver substrate; and

one or more ground plane layers that connect a body of the optical subassembly to a common mode grounding capacitor.

2. The system as recited in claim 1, wherein the optical subassembly is a transmitter optical subassembly.

3. The system as recited in claim 2, further comprising a receiver optical subassembly.

4. The system as recited in claim 1, wherein the signal trace layer comprises one or more traces that are connected to one or more of the laser source, a back facet photodiode, and a monitor photodiode.

5. The system as recited in claim 1, wherein the one or more ground plane layers further comprise a copper film adhered to the ground plane layers, wherein the copper film provides electromagnetic shielding.

6. The system as recited in claim 1, wherein the optical transceiver is configured for any one of 2.5 gigabit, 4.0 gigabit, and 10.0 gigabit communication speeds.

7. The system as recited in claim 1, further comprising one or more signal coupling capacitors positioned on the transceiver substrate, wherein the one or more signal coupling capacitors are positioned on any of an in and an out path for alternating current.

8. The system as recited in claim 7, wherein the optical signal source is one of a laser diode and a light emitting diode.

9. A coupling member for shielding electromagnetic radiation in a high speed optical transceiver comprising:

a signal trace layer for communicatively connecting one or more components mounted on a transceiver substrate to one or more components inside an optical subassembly;

a first ground plane layer positioned on a first side of the signal trace layer, the first ground layer providing the signal trace layer with electromagnetic shielding on at least the first side of the signal trace layer; and

a second ground plane layer positioned on a second side of the signal trace layer, wherein the second ground layer provides the signal trace layer with electromagnetic shielding on at least the second side.

10. The coupling member as recited in claim 9, wherein the subassembly is a transmitter optical subassembly.

11. The coupling member as recited in claim 9, wherein the second side of the signal trace layer opposes the first side of the signal trace layer.

12. The coupling member as recited in claim 9, wherein the coupling member is a flexible circuit board comprising the signal trace layer, the first ground layer, and the second ground layer mounted together as a single unit.

13. The coupling member as recited in claim 9, wherein any of the signal trace layer, the first ground plane layer, and the second ground plane layer comprise a flexible dielectric material.

14. The coupling member as recited in 13, wherein the flexible dielectric material is polyimide material, and wherein any of the first and second ground plane layers further comprise a copper insulating material that has been adhered to the polyimide material.

15. The coupling member as recited in claim 9, wherein one or more of the first and second ground layers is coupled to an outer body of the optical subassembly.

16. The coupling member as recited in claim 15, wherein the first and second ground plane layer couple the optical subassembly to a common mode grounding capacitor, such that the common mode grounding capacitor provides a ground for an outer shell of the optical subassembly.

17. The coupling member as recited in claim 9, further comprising one or more flex vias at an end of the coupling member, the one or more flex vias being coupled to corresponding one or more conductive pins that extend out of a back end of the optical subassembly.

18. The coupling member as recited in claim 17, wherein at least one of the one or more conductive pins is connected to an outer body of the optical subassembly.

19. The coupling member as recited in claim 17, wherein the one or more flex vias are soldered to the corresponding one or more conductive pins.

20. A method of minimizing electromagnetic radiation in an optical subassembly during high frequency data transfers using a multilayered coupling member, comprising the acts of:

transferring a high frequency electrical signal between a transceiver substrate and an optical subassembly through a multilayered coupling member;
and

discharging a common mode signal that builds on the optical subassembly through a common mode grounding capacitor.

21. The method of shielding an optical subassembly as recited in claim 20, further comprising an act of shielding electromagnetic radiation that emanates from a signal layer of the multilayered coupling member with one or more ground plane layers of the multilayered coupling member.

22. The method of shielding an optical subassembly as recited in claim 21, wherein the one or more ground plane layers comprise an insulating film adhered to the one or more ground plane layers.

23. The method of shielding an optical subassembly as recited in claim 22, further comprising coupling the signal layer of the multilayered coupling member to a signal coupling capacitor, such that the signal coupling capacitor isolates DC current at a capacitor that is different from the common mode grounding capacitor.